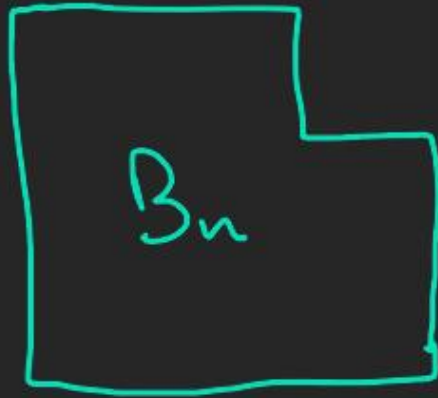


# POSSIBLE STATES OF LAST COLUMN



COMPLETELY  
FILLED



TOP CORNER  
EMPTY



BOTTOM  
CORNER  
EMPTY

Even though these are diff  
states, they will be equal for  
same  $n$  i.e.  $B_n = C_n$

# FINDING RECCURENCE RELATION

Calculating  $A_N$

$$\begin{array}{c} \boxed{A_N} = \boxed{A_{N-2}} \begin{array}{|c|} \hline 2 \times 1 \\ \hline 2 \times 1 \\ \hline 2 \times 1 \\ \hline \end{array} + \boxed{B_{N-1}} \begin{array}{|c|} \hline 2 \times 1 \\ \hline 1 \times 2 \\ \hline \end{array} + \boxed{C_{N-1}} \begin{array}{|c|} \hline 1 \times 2 \\ \hline 2 \times 1 \\ \hline \end{array} \\ \Downarrow \qquad \qquad \qquad \Downarrow \qquad \qquad \qquad \Downarrow \\ A_N = A_{N-2} + B_{N-1} + C_{N-1} \\ \qquad \qquad \qquad \underbrace{\hspace{10em}} \\ A_N = A_{N-2} + 2 * B_{N-1} \end{array}$$

Calculating  $B_N$

$$B_N = A_{N-1} + B_{N-2}$$

FINAL RECURSIVE RELATIONS :

$$A_N = A_{N-2} + 2 * (B_{N-1})$$

$$B_N = A_{N-1} + B_{N-2}$$

# BASE CASES

A  
3x0

A  
3x1

B  
3x0

B  
3x1

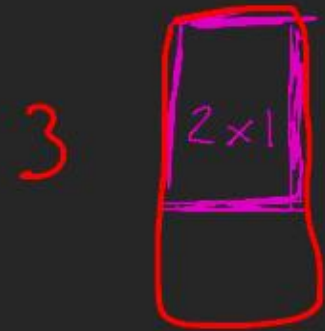


$$A_0 = 1$$

$$A_1 = 0$$



LAST COL COMPLETELY  
FILLED



$$B_0 = 0$$

$$B_1 = 1$$



TOP OR BOTTOM  
CORNER  
EMPTY